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<b>(21) International Application Number:</b> PCT/JP97/02884 <b>(22) International Filing Date:</b> 20 August 1997 (20.08.97)  <b>(30) Priority Data:</b> <table border="0"> <tr> <td>8/222768</td> <td>23 August 1996 (23.08.96)</td> <td>JP</td> </tr> <tr> <td>9/53193</td> <td>7 March 1997 (07.03.97)</td> <td>JP</td> </tr> <tr> <td>9/102155</td> <td>18 April 1997 (18.04.97)</td> <td>JP</td> </tr> <tr> <td>9/102156</td> <td>18 April 1997 (18.04.97)</td> <td>JP</td> </tr> <tr> <td>9/102157</td> <td>18 April 1997 (18.04.97)</td> <td>JP</td> </tr> </table> <b>(71) Applicant (for all designated States except US):</b> KAO CORPORATION [JP/JP]; 14-10, Nihonbashikayabacho 1-chome, Chuo-ku, Tokyo 103 (JP).  <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> KAMIYA, Tetsuro [JP/JP]; Kao Corporation, Research Laboratories, 1-3, Bunka 2-chome, Sumida-ku, Tokyo 131 (JP). KIMURA, Mitsutoshi [JP/JP]; Kao Corporation, Research Laboratories, 1-3, Bunka 2-chome, Sumida-ku, Tokyo 131 (JP). TANAKA, Norihiro [JP/JP]; Kao Corporation, Research Laboratories, 1-3, Bunka 2-chome, Sumida-ku, Tokyo 131 (JP). TAKEUCHI, Katsuhiko [JP/JP]; Kao Corporation, Research Laboratories, 1-3, Bunka 2-chome, Sumida-ku, Tokyo 131 (JP). TSUCHIYA, Shuichi [JP/JP];		8/222768	23 August 1996 (23.08.96)	JP	9/53193	7 March 1997 (07.03.97)	JP	9/102155	18 April 1997 (18.04.97)	JP	9/102156	18 April 1997 (18.04.97)	JP	9/102157	18 April 1997 (18.04.97)	JP	Kao Corporation, Research Laboratories, 2606, Akabane, Ichikai-machi, Haga-gun, Tochigi 321-34 (JP). HONDA, Miyuki [JP/JP]; Kao Corporation, Research Laboratories, 1-3, Bunka 2-chome, Sumida-ku, Tokyo 131 (JP).  <b>(74) Agents:</b> ARUGA, Mitsuyuki et al.; Kyodo Building, 3-6, Nihonbashiningyocho 1-chome, Chuo-ku, Tokyo 103 (JP).  <b>(81) Designated States:</b> CN, JP, US, VN, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).  <b>Published</b> <i>With international search report.</i> <i>Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.</i>
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<b>(54) Title:</b> AQUEOUS SKIN COSMETIC COMPOSITION CONTAINING A WATER-INSOLUBLE POWDER  <b>(57) Abstract</b> <p>The present invention relates to an aqueous skin cosmetic composition containing water and water-insoluble powder having an average particle diameter of 0.1-50 <math>\mu\text{m}</math>. The composition, when applied to wet skin after bathing or showering, is capable of providing excellent skin care effect over a prolonged period.</p>																	

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## DESCRIPTION

## AQUEOUS SKIN COSMETIC COMPOSITION CONTAINING A WATER-INSOLUBLE POWDER

## Field of the Invention

The present invention relates to skin cosmetic compositions which provide skin care effects, and more particularly to aqueous skin cosmetic compositions which provide skin care effects over prolonged periods when the compositions are applied to wet skin after bathing or showering, or when they are applied to wet skin after bathing or showering and are subsequently rinsed off.

## Background Art

Conventional skin cosmetic compositions used after bathing or showering include skin care agents such as nourishing creams containing oily ingredients and lotions containing natural humectant oils, glycerol, etc.; and skin-sensation-improving products (i.e., products that impart favorable dry feel to the skin) such as inorganic powders like talc or kaoline, or other powders having perspiration suppressing action and astringent action. Although these skin cosmetic compositions have not been developed with an aim to provide the after-bath-skin or after-shower-skin with skin care effects, they have long been used after bathing or showering because of their skin care effects and skin-sensation-improving effects.

Nourishing creams containing oily ingredients and lotions containing natural humectant oils, glycerol, etc.

exhibit excellent moisturizing effect on the skin. However, when the skin perspires, these products invite significantly sticky feel, and therefore, the user of them in summer is not comfortable. In contrast, inorganic powders such as talc and kaolin, and other powders having perspiration suppressing action or astringent action are acknowledged to be effective for the prevention of heat rash, because they absorb sweat and impart favorable dry sensation to the skin. When these powder products are applied to the skin, however, particles disperse in the air and sometimes enter the lungs upon breathing or enter the eyes, thus raising problems in use.

Therefore, products currently available from the market attempt to suppress dispersion of powder particles into the air by adding water to powders to form powder-in-liquid products, or incorporating powders into a cream or an ointment. However, there remain problems in use of these products: the part of the body to which they are applied often comes to look whitish, or they tend to adhere to clothing.

Accordingly, the object of the present invention is to provide a skin cosmetic composition containing a powder, which composition does not disperse powder particles into the air during use, does not give a whitish appearance to the skin to which the composition is applied, and does not adhere to clothing.

#### Means to Solve the Problems

In view of the foregoing, the present inventors have conducted careful studies, and have found that an aqueous

skin cosmetic composition containing water and water-insoluble powder dispersed therein whose particles have an average particle diameter of 0.1-50  $\mu\text{m}$  provides excellent dry sensation to the skin because the powder contained in the composition is adsorbed onto the skin, and that this effect can be obtained in any of the following situations when the composition is applied to wet skin after bathing or showering and subsequently the skin is caused to dry naturally; when the skin is towel-dried after application of the composition; and when the composition that has been applied to the skin is rinsed off with bath water or by showering.

The inventors have also found that when an oily substance is incorporated into the aqueous skin cosmetic composition of the present invention, improved skin care effect can be obtained, and in addition, enhanced effects can be obtained in terms of suppression of dispersion of powder particles into the air, prevention of white deposits remaining on the application site, and prevention of adhesion of the composition to clothing. Moreover, the inventors also found that when a refreshing agent is incorporated, there is obtained not just a refreshing feel, but a refreshing feel which lasts for a dramatically prolonged period. Furthermore, when a viscosity increasing agent is incorporated into the aqueous skin cosmetic composition of the present invention, dispersion stability of the powder is improved, application of the composition to the skin becomes easier, and better tactile sensation upon

application can be obtained.

Accordingly, the present invention provides an aqueous skin cosmetic composition containing water and water-insoluble powder dispersed therein whose particles have an average (particle) diameter of 0.1-50  $\mu\text{m}$ .

The aqueous skin cosmetic composition of the present invention may optionally contain an oily substance.

The aqueous skin cosmetic composition of the present invention may optionally contain a refreshing agent.

The aqueous skin cosmetic composition of the present invention may optionally contain a thickening agent

The present invention also provides a skin care method for the human body characterized by applying any of the above-mentioned aqueous skin cosmetic compositions to the skin wetted with water, and subsequently towel-drying the skin.

In the method described above, after application of the skin cosmetic composition to wet skin and before towel-drying, the composition may be rinsed off with water.

#### Modes for Carrying Out the Invention

The aqueous skin cosmetic composition of the present invention may be rinsed off after being applied to the skin. Conventional products that are categorized as removal-after-application agents (which are rinsed off after application) include soap, liquid soap, shampoos, and conditioners. Primary purposes of these products are removal of skin dirt through purposeful incorporation of surfactants or alteration of the tactile sensation of the skin through incorporation of

cationic compounds and adsorption thereof onto the skin. In contrast, the skin cosmetic composition of the present invention is specifically designed to adsorb powders onto the skin, and thus, cleansing or washing the skin is not the purpose of the present invention. Because of this basic concept, the skin cosmetic composition of the present invention does not substantially contain surfactants for the purpose of cleansing. Thus, the products and methods of the present invention are completely different from those of conventional skin cosmetic compositions.

Water-insoluble powders used in the present invention are not particularly limited, and powders ordinarily incorporated into cosmetic compositions may be used. For example, there may be used inorganic powders such as talc, sericite, mica, kaolin, red (iron) oxide, clay, bentonite, silicic acid, silicic anhydride, magnesium silicate, mica, magnesium oxide, zinc oxide, titanium oxide, aluminum oxide, aluminum sulfate, alum, calcium sulfate, barium sulfate, and magnesium sulfate; and organic powders such as polyamides, polyesters, polyethylene, polypropylene, polystyrene, ethylene/acrylic acid copolymers, styrene/acrylic acid copolymers, polyurethanes, vinyl resins, polycarbonate resins, nylon, silk, cellulose resins, silicone resins, and polyacrylic acids. Of these materials, particularly preferred ones are talc, sericite, mica, kaolin, and silicone powders, as they provide excellent sensation on wet skin and also to the touch of the skin after towel-drying.

The shape of the particles of the powders is not

particularly limited, and the particles may be plate-shaped, block-shaped, flake-shaped, and spherical. Plate-shaped, flake-shaped, or spherical particles are preferred for enhancing the tactile sensation of the skin.

The powders which are used in the present invention have an average particle size of 0.1-50  $\mu\text{m}$ , with 1-20  $\mu\text{m}$  being particularly preferred. Powders having an average particle size less than 0.1  $\mu\text{m}$  cannot provide favorable dry sensation of the skin, whereas those having an average particle size in excess of 50  $\mu\text{m}$  impede the effect of the present invention as they provide a rough touch.

The powders are incorporated into the composition of the present invention in an amount of 1-60% by weight (hereinafter referred to simply as %), preferably 5-60%, and particularly preferably 5-25%.

In the present invention, it is recommended that powder of spherical particles and powder of plate-shaped particles are used in combination. When this is done, the resultant composition spreads excellently when being applied to the skin, and in addition, the composition is capable of imparting a dry and refreshing sensation under conditions of high temperature and high humidity. Such effects are significant when the composition of the present invention is applied to perspiring skin, or wet skin in the case of, for example, bathing. In other words, when powder of spherical polymer particles, which are considered to spread excellently and provide a smooth tactile sensation, is solely incorporated into a composition and such a



composition is applied to wet skin, the effect obtained is not necessarily satisfactory. Thus, in the case in which a powder of spherical particles and a powder of plate-shaped particles are used in combination, excellent spreadability and favorable dry sensation can be obtained even when the resultant composition is applied to wet skin.

In the present invention, "powder of spherical particles" refers to a powder formed of generally spherical particles, and it does not mean that the powder is formed of geometrically perfect spherical particles. Materials of the powder of spherical particles include silicone powders, nylon, polystyrene, polyethylene, polypropylene, polytetrafluoroethylene, polyvinyl chloride, acrylic acid polymers or acrylate polymers, methacrylic acid polymers or methacrylate polymers, acrylate/styrene copolymers, and styrene/divinylbenzene copolymers. Of these materials, silicone powders are particularly preferred, because when they are incorporated together with a plate-shaped powder, they exhibit excellent spreadability and provide a favorable dry sensation upon application to the skin.

Silicone powders are pulverized products of a silicone resin or silicone rubber, and their particle shape is roughly spherical. So long as they are obtained through pulverization of a silicone resin, etc., there is no particular limitation on the species of organopolysiloxanes, fillers, or those of hardening agents, nor on the molar ratio between the organic group and silicon atoms. Commercial products of silicone powders include Tospearl (by

Toshiba Silicone), Torefile (by Toray Dow-Corning), and Silicon-powder (by Shin'etsu Chemical).

In the present invention "powder of plate-shaped particles" refers to a powder formed of plate-shaped or rod-shaped particles, examples of which include talc, sericite, kaolin, and magnesium silicate. Of these, talc is particularly preferred from the viewpoint of the spreadability and the ability to impart dry and refreshing sensation to the skin when applied to the skin along with a powder of spherical particles.

The proportion by weight of the spherical powder and the plate-shaped powder is preferably between 20:1 and 1:20, more preferably between 10:1 and 1:10, and most preferably between 5:1 and 1:5, in consideration of excellent spreadability, effect of sufficient enhancement in favorable dry feel, and favorable dry feel to be secured under conditions of high temperature and high humidity.

The cosmetic compositions of the present invention may contain, in addition to the combination of a powder of spherical particles and a powder of plate-shaped particles, a powder of particles having a different shape. It is preferable that a powder of spherical particles and a powder of plate-shaped particles together account for 50-100%, particularly 60-100% of the amount in total of the powders.

In the present invention, the powders are preferably present as dispersed in water. The amount of water is preferably 0.4-100 times by weight, particularly preferably 0.5-50 times that of the total weight of the powders.

The diameter of the particles contained in powders used in the present invention can be measured by use of a microscope. In the case of plate-shaped particles the particle diameter is considered the length of the longest portion.

An oily substance may be included in the skin cosmetic composition of the present invention with an aim to additionally impart moistened sensation to the skin. The oily substance is not particularly limited as long as it is liquid at ambient temperature. From the viewpoint of ability to improve the sensation during use, preferred ones include avocado oil, camellia oil, turtle oil, corn oil, olive oil, wheat embryo oil, soybean oil, jojoba oil, peanut oil, cacao butter, lanolin, liquid paraffin, squalane, squalene, vaseline, cholesteryl esters, and silicone oils.

In addition, it is more advantageous to incorporate one or more oily substances having a surface tension of not more than 30 dyn/cm at 25°C, because such incorporation improves sensation during use, particularly moisture-removal effect during towel-drying after the composition is applied to wet skin, and sweat-removal effect when the person perspires. One example of such an oily substance is silicone oil, and specific examples include methylpolysiloxane, dimethylpolysiloxane, methylcyclopolysiloxane, diethylpolysiloxane, methylphenylpolysiloxane, fatty-acid-modified polysiloxane, higher-alcohol-modified polysiloxane, and amino-modified polysiloxane. Of these substances, methylpolysiloxane and dimethylpolysiloxane, particularly

those having a viscosity of not more than 200 cs at 25°C, are preferred in view of their ability to enhance sensation during use.

The proportion of the oily substance having a surface tension of not more than 30 dyn/cm to be contained in the composition is preferably 0.1-20%, more preferably 1-10%.

The proportion of the oily substances and powders is preferably 1:20 - 20:1 on a weight basis from the viewpoint of excellent sensation during use in environments of high temperature and high humidity, and more preferably 1:1 - 1:10 in consideration of increased residual amounts of the powder on the skin.

In the present invention, when a refreshing agent is incorporated as described above, a refreshing feel—a long-lasting refreshing feel—can be obtained upon application of the composition onto the skin.

The refreshing agents which are used in the present invention are not particularly limited so long as they ensure long-lasting refreshing sensation, without causing irritation or sticky sensation, when they are applied to the skin. Preferred such agents include *l*-menthol and their derivatives (e.g., menthyl lactate, menthyl acetate, menthone, etc.), peppermint oil, and camphor, with *l*-menthol and their derivatives being particularly preferred.

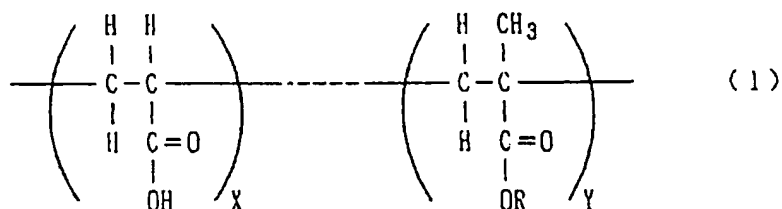
The amount of the refreshing agents to be incorporated is preferably 0.05-5% by weight, more preferably 0.07-1% by weight, and most preferably 0.1-0.5% by weight, in order to provide sufficient refreshing sensation to the skin.

The proportion of the water-insoluble powders and cool-sensation-imparting agents is preferably 200:1 - 10:1 on a weight basis, more preferably 180:1 - 20:1, so as to ensure long-lasting effect of refreshing sensation derived from the cool-sensation-imparting agents.

In the present invention, thickening agents improve dispersion stability of the powders, and spreadability and tactile sensation of the composition upon application of the composition. Preferred examples of viscosity increasing agents include (meth)acrylic acid/alkyl(meth)acrylate copolymers; (meth)acrylate polymers (such as carboxyvinyl polymers); methacrylic acid/acrylic acid copolymers; polysaccharides or their derivatives such as guar gum, xanthane gum, methylcellulose, hydroxyethylcellulose, and carboxymethylcellulose; and water-soluble polymers such as polyvinyl alcohol. Of these substances, (meth)acrylic acid/alkyl(meth)acrylate is particularly preferred. (Meth)acrylic acid/alkyl(meth)acrylate copolymers have, in addition to a function as viscosity-increasing agents, or a function as emulsifiers. In general, nonionic and cationic surfactants have been used as surfactants to be incorporated into cosmetic compositions. However, use of these types of surfactants results in an aggravated sticky sensation. In contrast, (meth)acrylic acid/alkyl(meth)acrylate copolymers ensure smooth sensation while providing no stickiness. Moreover, use of the (meth)acrylic acid/alkyl(meth)acrylate copolymers enables formation of a stable emulsion without

use of nonionic or cationic surfactants, as well as formation of gel-state cosmetic compositions.

The (meth)acrylic acid/alkyl(meth)acrylate copolymers which are used in the present invention preferably have a structure of the following formula (1):



(wherein R represents a C10-C30 alkyl group, X and Y independently represent the mole% of respective corresponding units contained in the copolymer, with X being 80.0-99.9 mole% and Y being 0.1-20.0 mole%.) These copolymers are available on the market. For example, PEMULEN TR-1 and PEMULEN TR-2 manufactured by B.F. Goodrich may be used. These may be used singly or in combination of two or more. Acrylic acid/alkyl methacrylate copolymers are particularly preferred.

In the cosmetic composition of the present invention, the amount of the viscosity-increasing agent is preferably 0.01-5%, more preferably 0.01-2%, in consideration of the dispersion stability of the powders and tactile sensation on the skin.

The cosmetic composition of the present invention may contain alcohols. Examples of preferred alcohols include ethyl alcohol, propylene glycol, 1,3-butylene glycol, glycerol, and sorbitol. These may be used singly or in

combination of two or more. The amount of alcohols is preferably 0.01-60%, more preferably 0.1-20%, from the viewpoint of excellent sensation during use.

The cosmetic composition of the present invention may optionally include physiologically effective humectants, anti-inflammatory agents, whitening agents, UV-care agents, bactericides, perspiration-suppression agents, perfumes, etc. Examples of humectants include glycerol, lactic acid, ceramide, and cholesteryl esters. The amount of humectants is preferably 0.1-40%, more preferably 1-10%, from the viewpoint of excellent sensation during use.

Examples of anti-inflammatory agents include glycyrrhizates,  $\beta$ -glycyrrhetinic acid, allantoin, indomethacin, guaiazulene, guaiazulenele sulfonate, crude drug extracts, and herb extracts. The amount of anti-inflammatory agents is preferably 0.01-10%, more preferably 0.1-2%, of the cosmetic composition of the present invention so as to ensure the effects of the present invention.

Whitening agents and UV-care agents include vitamin C derivatives (magnesium ascorbic phosphate, etc.), Arbutin, kojic acid, camomile extracts, Varsol MCX, Escalol 507, oxybenzone, and Uvinul. They are preferably incorporated in a proportion of 0.01-10%, more preferably 0.1-5%, of the cosmetic composition of the present invention so as to ensure the effects of the present invention.

Examples of bactericides include benzalkonium chloride, benzethonium chloride, trichlorocarbanilide, pyridinium cetyl chloride, and isopropyl methylphenol. The amount of

bactericides is preferably 0.01-5%, more preferably 0.1-1%, so as to ensure the effects of the present invention.

Examples of perspiration-suppressing agents include aluminum chloride, chlorohydroxyaluminum, aluminum lactate, allantoin aluminum derivatives, and zinc p-phenolsulfonate. The amount of perspiration-suppressing agents is preferably 0.01-10%, more preferably 0.05-5%, of the cosmetic composition of the present invention so as to ensure the effects of the present invention.

The cosmetic composition of the present invention is advantageously applied to the skin, *inter alia*, the body skin. Thus, preferably, the composition of the invention is used as a skin care composition for the human body. Since the composition of the invention provides excellent tactile sensation under conditions of high temperature and high humidity, it is preferably used as a skin care agent for summer use, particularly a skin care agent to be applied to wet skin after bathing or showering.

As to the method for applying the cosmetic composition of the present invention, the following methods are preferred: a method in which the composition is applied to wet skin following bathing or showering and the skin is allowed to dry naturally; a method in which the composition is applied to wet skin, and subsequently the skin is towel-dried; and a method in which the composition is applied to the skin, rinsed off with bath water or shower water, and subsequently the skin is subjected to towel-drying.

When the cosmetic composition of the present invention



is applied to wet skin, powder components of the composition are adsorbed specific onto the swollen keratinocyte after bathing or showering, and only small amounts of application are sufficient for spreading over and covering all the body surfaces. Thus, neither natural drying nor towel-drying causes removal of the powder components from the skin. Moreover, when the composition is rinsed off with bath water or shower water, sufficient amounts of powder components remain on the skin, providing proper, favorable dry sensation to the skin over prolonged periods. Also, when humectants, antiinflammatory agents, whitening agents, UV-care agents, bactericides, perspiration suppressing agents, and perfumes are incorporated, the skin can be more functionally conditioned after bathing or after showering, and moistened feel and aroma can be enjoyed.

#### Examples

The present invention will hereunder be described in detail by way of examples, which should not be construed as limiting the invention.

#### Inventive Examples 1-11 and Comparative Examples 1-3:

The ingredients shown in Tables 1 through 4 were mixed with a homogenizing mixer. Purified water was added to each mixture to make the resultant mixture, i.e., a skin cosmetic composition, 100 parts by weight. In Comparative Example 3, purified water was not added, and accordingly, a powdery composition was prepared.

The thus-obtained cosmetic compositions were used by a total of 100 men and women (age: 20-40) in a manner as described below. Also, they were evaluated upon use in accordance with the evaluation standards described below. The evaluation results are indicated by the number of persons.

Manner of use

Respective compositions are applied to the skin wetted by showering, and subsequently the skin is towel-dried.

Evaluation items

Ease in application

Ease in towel-drying (ease in wiping off water droplets)

Sensation of the skin after towel-drying (favorable dry and refreshing sensation)

A: Good

B: Moderate

C: Poor

Adhesion of powder to the skin (whitish appearance or not)

Adhesion of powder to clothing

Dispersion of powder in the air

A: None

B: Slightly recognizable

C: Clearly present

Table 1

Ingredients (parts by weight)		Examples		
		1	2	3
Talc (JA46R, av. particle size: 5 $\mu$ m, by Asada Seiyaku K.K.)		10	15	-
Kaolin (av. particle size: 8 $\mu$ m)		-	-	8
Nylon powder (SP500, av. particle size: 5 $\mu$ m, by Toray Dow-Corning)		10	-	-
Silicon powder (Tospearl 145, av. particle size: 4.5 $\mu$ m, by Toshiba Silicone)		-	5	-
Polyacylic powder (av. particle size: 4 $\mu$ m)		-	-	10
Ethanol		10	15	15
Glycerol		-	-	-
Propylene glycol		-	-	-
Silicone oil (SH244, 16 dyn/cm (25°C), by Toray Dow-Corning)		2	2	4
Silicone oil (SH200, 10 cs., 20.1 dyn/cm (25°C), by Toray Dow-Corning)		4	4	-
Squalane		-	-	2
Avocado oil		-	1	-
l-menthol		0.8	-	-
Perfume		-	0.4	0.4
Methylparaben		0.2	0.2	0.2
Butylparaben		0.1	0.1	0.1
Purified water		62.9	57.3	60.3
Total		100	100	100
Ease of application	A	97	98	98
	B	3	2	2
	C	0	0	0
Ease of towel-drying	A	98	99	95
	B	2	1	5
	C	0	0	0
Sensation of the skin after towel-drying	A	96	97	97
	B	4	3	3
	C	0	0	0
Adhesion of powder to the skin	A	100	100	100
	B	0	0	0
	C	0	0	0
Adhesion of powder to clothing	A	100	100	100
	B	0	0	0
	C	0	0	0
Dispersion of powder in the air	A	100	100	100
	B	0	0	0
	C	0	0	0

Table 2

Ingredients (parts by weight)		Examples		
		4	5	6
Talc (JA46R, av. particle size: 5 $\mu$ m, by Asada Seiyaku K.K.)		10	15	8
Kaolin (av. particle size: 8 $\mu$ m)		-	-	-
Nylon powder (SP500, av. particle size: 5 $\mu$ m, by Toray Dow-Corning)		-	-	-
Silicon powder (Tospearl 145, av. particle size: 4.5 $\mu$ m, by Toshiba Silicone)		-	-	-
Polyacylic powder (av. particle size: 4 $\mu$ m)		-	-	-
Ethanol		15	10	20
Glycerol		-	5	-
Propylene glycol		-	-	5
Silicone oil (SH244, 16 dyn/cm (25°C), by Toray Dow-Corning)		4	5	5
Silicone oil (SH200, 10 cs., 20.1 dyn/cm (25°C), by Toray Dow-Corning)		4	-	-
Squalane		-	4	-
Avocado oil		-	-	4
l-menthol		0.5	-	-
Perfume		-	0.4	-
Methylparaben		0.2	0.2	0.2
Butylparaben		0.1	0.1	0.1
Purified water		66.2	60.3	57.7
Total		100	100	100
Ease of application	A	95	98	99
	B	5	2	1
	C	0	0	0
Ease of towel-drying	A	96	98	96
	B	4	2	4
	C	0	0	0
Sensation of the skin after towel-drying	A	98	95	97
	B	2	5	3
	C	0	0	0
Adhesion of powder to the skin	A	100	100	100
	B	0	0	0
	C	0	0	0
Adhesion of powder to clothing	A	100	100	100
	B	0	0	0
	C	0	0	0
Dispersion of powder in the air	A	100	100	100
	B	0	0	0
	C	0	0	0

Table 3

Ingredients (parts by weight)		7	8	Examples		
				9	10	11
Talc (JA46R, av. particle size: 5 $\mu$ m, by Asada Seiyaku K.K.)		12.5	10.0	-	-	12.5
Kaolin (av. particle size: 8 $\mu$ m)		-	-	-	-	-
Nylon powder (SP500, av. particle size: 5 $\mu$ m, by Toray Dow-Corning)		-	-	-	-	-
Silicon powder (Tospearl 145, av. particle size: 4.5 $\mu$ m, by Toshiba Silicone)		5.0	1.0	10.0	5.0	1.0
Polyacrylic powder (av. particle size: 4 $\mu$ m)		-	-	-	-	-
Ethanol		7.5	1.0	10.0	1.0	0.1
Glycerol		-	-	-	-	-
Propylene glycol		-	-	-	-	-
Silicone oil (SH244, 16 dyn/cm (25°C), by Toray Dow-Corning)		2.5	1.0	-	1.0	-
Silicone oil (SH200, 10 cs., 20.1 dyn/cm (25°C), by Toray Dow-Corning)		2.5	1.0	2.0	1.0	2.0
Squalane		-	-	-	-	-
Avocado oil		-	-	-	-	-
l-menthol		0.4	0.05	0.01	0.1	-
Perfume		0.5	0.2	0.2	0.2	0.2
Methylparaben		0.1	0.1	0.1	0.1	0.1
Butylparaben		0.2	0.2	0.2	0.2	0.2
Purified water		68.8	85.45	77.49	91.4	83.9
Total		100.0	100.0	100.0	100.0	100.0
Ease of application	A	96	98	99	97	95
	B	4	2	1	3	5
	C	0	0	0	0	0
Ease of towel-drying	A	97	96	99	98	97
	B	3	4	1	2	3
	C	0	0	0	0	0
Sensation of the skin after towel-drying	A	95	97	99	98	96
	B	5	3	1	2	4
	C	0	0	0	0	0
Adhesion of powder to the skin	A	100	100	100	100	100
	B	0	0	0	0	0
	C	0	0	0	0	0
Adhesion of powder to clothing	A	100	100	100	100	100
	B	0	0	0	0	0
	C	0	0	0	0	0
Dispersion of powder in the air	A	100	100	100	100	100
	B	0	0	0	0	0
	C	0	0	0	0	0

Table 4

Ingredients (parts by weight)		Comparative Examples	
		1	2
Talc (JA46R, av. particle size: 5 $\mu$ m, by Asada Seiyaku K.K.)		-	-
Kaolin (av. particle size: 8 $\mu$ m)		-	8
Nylon powder (SP500, av. particle size: 5 $\mu$ m, by Toray Dow-Corning)		-	-
Silicon powder (Tospearl 145, av. particle size: 4.5 $\mu$ m, by Toshiba Silicone)		-	-
Polyacylic powder (av. particle size: 4 $\mu$ m)		-	10
Ethanol		10	15
Glycerol		-	-
Propylene glycol		-	-
Silicone oil (SH244, 16 dyn/cm (25°C), by Toray Dow-Corning)		2	4
Silicone oil (SH200, 10 cs., 20.1 dyn/cm (25°C), by Toray Dow-Corning)		4	-
Squalane		-	2
Avocado oil		-	-
l-menthol		0.8	-
Perfume		-	0.4
Methylparaben		0.2	0.2
Butylparaben		0.1	0.1
Purified water		82.9	-
Total		100	39.7
Ease of application	A	90	0
	B	10	10
	C	0	90
Ease of towel-drying	A	35	2
	B	55	45
	C	10	53
Sensation of the skin after towel-drying	A	25	15
	B	30	45
	C	40	40
Adhesion of powder to the skin	A	100	10
	B	0	50
	C	0	40
Adhesion of powder to clothing	A	100	8
	B	0	65
	C	0	27
Dispersion of powder in the air	A	100	6
	B	0	29
	C	0	65

From Tables 1 to 4, it was confirmed that all compositions of Examples 1 through 11 were superior to Comparative Examples 1 and 2 with respect to all items.

#### Examples 12-19:

The ingredients shown in Table 5 were mixed with a homogenizing mixer. Purified water was added to each mixture to make the resultant mixture, i.e., a skin cosmetic composition, 100 percent.

The thus-obtained cosmetic compositions were used by a total of 100 men and women (age: 20-40) in a manner as described below. Also, they were evaluated upon use in accordance with the evaluation standards described below. The evaluation results are indicated by the number of persons.

#### Manner of use

Respective compositions are applied to the skin wetted by showering, and subsequently the skin is towel-dried.

#### Evaluation items

After the skin is towel-dried, the skin sensation (whether there is a favorable dry and refreshing sensation) was evaluated after the person stayed in an environment of 75% humidity and a temperature of 20°C, 30°C, or 35°C. Numbers of persons who answered "good" are shown in Table 5.

Table 5

Ingredients (%)	Examples									
	12	13	14	15	16	17	18	19		
Talc (JA46R, av. particle size: 5 $\mu$ m, by Asada Seifun K.K.)	20	20	20	20	10	20	3	12.5		
Silicon powder (Tospearl 145, av. particle size: 4.5 $\mu$ m, by Toshiba Silicone)	10	15	20	10	5	3	20	5		
Silicone oil (SH244, 16 dyn/cm (25°C), by Toray Dow-Corning)	5	15	15	5	5	5	5	5		
Glycerol	1	5	10	-	5	5	5	-		
Squalane	0.2	2	10	-	2	2	2	-		
Carboxyvinyl polymer (Carbopol)	-	0.5	0.5	-	0.5	0.5	0.5	-		
Perfume	1	1	1	1	1	1	1	1		
Colorant (Blue No. 1)	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 7.5	
Ethanol										
Neutralizer	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	
Purified water	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	Balance	
Skin sensation at 20°C	98	95	89	99	99	80	85	90		
Skin sensation at 30°C	88	72	58	58	85	67	75	60		
Skin sensation at 35°C	75	61	55	55	76	50	60	58		



From Table 5, it is clear that the compositions of the present invention which contains both a powder of spherical particles and a powder of plate-shaped particles provide excellent sensation to the skin when applied to the body and particularly remarkable dry and refreshing sensation under conditions of high temperature. It is also noted that when the proportion by weight of a powder of spherical particles and a powder of plate-shaped particles is between 1:20 and 20:1, the dry and refreshing sensation was significantly excellent under conditions of high temperature and high humidity. The cosmetic compositions of the present invention never caused a whitish appearance attributed to the residue of powders, adhesion of powders to clothing, or dispersion of powders in the air upon application of the composition, and therefore, the usability of the compositions was excellent.

Examples 20-27 and Comparative Examples 3 and 4:

The ingredients shown in Tables 6 and 7 were added to purified water with stirring to prepare aqueous skin cosmetic compositions through stirring and mixing. The "%" in the Tables indicate % by weight. Each of the obtained aqueous skin cosmetic compositions was applied to the skin wetted by showering (the number of tested men and women:100 in total/age:20-40) and thereafter the skin was towel-dried, to evaluate refreshing-feeling effects of the compositions at each time of immediate, 15 and 30 minutes after application. The results are shown in Tables 6 and 7.

Table 6

Ingredients	Example 20 Lotion Amount(%)	Example 21 Lotion Amount(%)	Example 22 Lotion Amount(%)	Example 23 Lotion Amount(%)	Example 24 Lotion Amount(%)
Talc	20	-	10	20	-
Aluminum hydroxide	5	5	-	5	5
Silicon powder	-	10	-	-	10
Nylon powder	-	-	10	-	-
Acrylic polymer	-	-	-	-	-
l-menthol	0.2	0.5	0.5	-	-
l-Menthyl lactate (by Hermanandrimmer Japan)	-	-	-	0.2	0.5
Dimethyl polysiloxane	5	5	5	5	5
Glycerol	1	1	1	1	1
Squalane	0.2	0.2	0.2	0.2	0.2
Carboxyvinyl polymer (Carbopol)	0.5	0.5	0.5	0.5	0.5
Perfume	1	1	1	1	1
Colorant (Blue No. 1)	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20
Alcohol	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20	Suitable amount 20
Neutralizer	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance
Purified water	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance
Effect*					
Immediately after application	91	95	96	98	92
15 min. after application	79	90	88	90	83
30 min. after application	75	88	76	75	79
Evaluation standards* : Number of persons who acknowledged refreshing feeling (in 100 persons)					

Table 7

Ingredients	Example 25 Lotion Amount(%)	Example 26 Lotion Amount(%)	Example 27 Lotion Amount(%)	Comp. Ex. 3 Lotion Amount(%)	Comp. Ex. 4 Lotion Amount(%)
Talc	10	20	12.5	-	-
Aluminum hydroxide	-	5	-	-	-
Silicon powder	-	-	5	-	-
Nylon powder	10	-	-	-	-
Acrylic polymer	-	-	-	-	-
l-menthol	-	0.2	0.4	0.5	-
l-menthyl lactate (by Hermanandrimmer Japan)	0.5	0.2	-	-	0.5
Dimethyl polysiloxane	5	5	5	5	5
Glycerol	1	1	-	1	1
Squalane	0.2	0.2	-	0.2	0.2
Carboxyvinyl polymer (Carbopol)	0.5	0.5	-	0.5	0.5
Perfume	1	1	1	1	1
Colorant (Blue No. 1)	Suitable amount 20	Suitable amount 20	Suitable amount 10	Suitable amount 20	Suitable amount 20
Alcohol					
Neutralizer	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance	Suitable amount Balance
Purified water					
Effect					
Immediately after application	88	86	99	75	68
15 min. after application	82	79	95	18	22
30 min. after application	77	72	90	2	3
Evaluation standards* : Number of persons who acknowledged refreshing feeling (in 100 persons)					

From Tables 6 and 7, it was confirmed that all compositions of Examples 20 through 27 provide more refreshing sensation than compositions of Comparative Examples 3 or 4 in any case of immediately after application, 15 minutes after application, and 30 minutes after application.

Examples 28-31:

The ingredients shown in Table 8 were mixed with a homogenizing mixer. Purified water was added to each mixture to make the resultant mixture, i.e., an aqueous skin cosmetic composition, 100 parts by weight.

The thus-obtained cosmetic compositions were used by a total of 100 men and women (age: 20-40) in a manner that the compositions were applied to wet skin after showering and the skin was subsequently towel-dried. Tactile sensation to the skin and the state of dispersion of respective compositions were evaluated. As a result, compositions that contained Pemulen TR-1 (a viscosity-increasing agent; a (meth)acrylic acid/alkyl(meth)acrylate copolymer) exhibited markedly excellent skin sensation and state of dispersion as compared with the cosmetic compositions which did not contain this ingredient.

Table 8

Ingredients	Examples			
	28	29	30	31
Talc [JA-46R (av. particle size: 4.5 $\mu$ m)]	12.5	5.0	12.5	2.5
Silicon powder [Tospearl 145 (av. particle size: 4.5 $\mu$ m)]	5.0	2.5	1.0	10.0
Pemulen TR-1	0.125	0.125	0.125	0.125
Ethanol	7.500	5.000	2.500	2.500
Silicone oil (SH244)	2.500	2.500	-	2.500
Silicone oil (SH200)	2.500	2.500	2.500	2.500
Perfume	1.000	1.000	1.000	1.000
Ethylparaben	0.200	0.200	0.200	0.200
Butylparaben	0.100	0.100	0.100	0.100
Purified water	68.575	81.075	80.075	78.575

## Examples 32 and 33:

By use of the ingredients shown in Table 9, aqueous skin cosmetic compositions were prepared. Each of the obtained cosmetic compositions was applied to wet after-shower skin, and thereafter the skin was towel-dried. The compositions were evaluated in terms of ease of receiving in hands, ease of spreading over the body, and uniformity of the skin sensation. As a result, it was revealed that all the cosmetic compositions of Examples 32 through 35 were superior to the compositions that contained no viscosity-increasing agents.

Table 9

Ingredients	Examples	
	32	33
Talc (av. particle size: 4.5 $\mu$ m)	5	10
Magnesium carbonate	5	2
Nylon powder	2	-
Silicon powder	-	5
Polyethylene powder	3	-
Silicone oil	10	10
Carbopol	0.2	-
Pemulen TR-1	-	0.2
Ethanol	5	5
Purified water	Balance	Balance

## CLAIMS

1. An aqueous skin cosmetic composition containing water-insoluble powder having an average particle diameter of 0.1-50  $\mu\text{m}$  and water.
2. The aqueous skin cosmetic composition according to claim 1 wherein the average particle diameter is 0.1-15  $\mu\text{m}$ .
3. The aqueous skin cosmetic composition according to claim 1 or 2 wherein the water-insoluble powder is a powder of spherical particles and/or a powder of plate-shaped particles.
4. The aqueous skin cosmetic composition according to any one of claims 1 through 3 wherein the water-insoluble powder is a silicone powder and/or talc.
5. The aqueous skin cosmetic composition according to any one of claims 1 through 4 wherein the content in total of water-insoluble powders is 1-60% by weight.
6. The aqueous skin cosmetic composition according to any one of claims 1 through 5 which further contains an oily substance.
7. The aqueous skin cosmetic composition according to claim 6 wherein the oily substance comprises a substance having a surface tension of not more than 30 dyn/cm at 25°C.
8. The aqueous skin cosmetic composition according to claim 6 or 7 wherein the ratio by weight of the oily substance to the water-insoluble powder is 1:20 - 20:1.
9. The aqueous skin cosmetic composition according to any one of claims 1 through 8 which further contains a cool-sensation-imparting agent.

10. The aqueous skin cosmetic composition according to claim 9 wherein the cool-sensation-imparting agent is l-menthol or a derivative thereof.

11. The aqueous skin cosmetic composition according to claim 9 or 10 wherein the ratio by weight of the water-insoluble powder to the cool-sensation-imparting agent is 200:1 - 10:1.

12. The aqueous skin cosmetic composition according to any one of claims 1 through 11 which further contains a viscosity-increasing agent.

13. The aqueous skin cosmetic composition according to claim 12 wherein the viscosity-increasing agent is selected from the group consisting of (meth)acrylic acid/alkyl(meth)acrylate copolymers, (meth)acrylate polymers, methacrylic acid/acrylic acid copolymers, polysaccharides, derivatives of polysaccharides, and water-soluble polymers.

14. The aqueous skin cosmetic composition according to claim 12 wherein the viscosity-increasing agent is a (meth)acrylic acid/alkyl(meth)acrylate copolymer.

15. The aqueous skin cosmetic composition according to any one of claims 12 through 14 wherein the viscosity-increasing agent is contained in an amount of 0.01-5% by weight.

16. The aqueous skin cosmetic composition according to any one of claims 1 through 15 which, in use, is applied to the human body.

17. The aqueous skin cosmetic composition according to



any one of claims 1 through 16 which, in use, is applied to the skin wetted with water.

18. The aqueous skin cosmetic composition according to any one of claims 1 through 16 which, in use, is applied to the skin wetted with water and subsequently towel-dried.

19. The aqueous skin cosmetic composition according to any one of claims 1 through 16 which, in use, is applied to the skin wetted with water, rinsed off with water, and then towel-dried.

20. A skin care method for human bodies characterized by applying the cosmetic composition described in any one of claims 1 through 15 to the skin wetted with water and subsequently by towel-drying.

21. A skin care method for human bodies characterized in that the cosmetic composition described in any one of claims 1 through 15 is applied to the skin wetted with water, rinsed off with water, and then towel-dried.

# INTERNATIONAL SEARCH REPORT

International Application No

PCT/JP 97/02884

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 A61K7/035 A61K7/48

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 A61K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 93 13745 A (OREAL) 22 July 1993  see page 1-2 see page 6, line 19-35 see page 7-11, line 18 see page 15, line 14-16 ---	1-8, 13-21
X	EP 0 385 312 A (KAO CORP) 5 September 1990  see the whole document ---	1-11, 16-21
X	EP 0 469 602 A (KAO CORP) 5 February 1992  see the whole document ---	1-8, 12, 16-21
	-/--	

☒ Further documents are listed in the continuation of box C.

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X	<p>R. KERAUDY: "Les poudres polyamides dans les formulations cosmétiques"            PARFUMS, COSMÉTIQUES, ARÔMES,            vol. 52, 1983,            page 83-85 XP002049600            see the whole document            -----</p>	<p>1-3,6,7,            16,21</p>

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